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Proceedings of the Maritimes Regional Advisory Process of the Eastern Scotian Shelf Snow Crab

30-31 January 2002
Mic Mac Amateur Aquatic Club
Dartmouth, Nova Scotia

René Lavoie (Chair)

Bedford Institute of Oceanography
1 Challenger Drive, P.O. Box 1006
Dartmouth, Nova Scotia
B2Y 4A2

Compte rendu du Processus consultatif régional des Maritimes concernant le crabe des neiges de l'est du plateau néo-écossais

du 30 au 31 janvier 2002
Mic Mac Amateur Aquatic Club
Dartmouth (Nouvelle-Écosse)

René Lavoie (président)

Institut océanographique de Bedford
1, rue Challenger, C.P. 10006
Dartmouth (Nouvelle-Écosse)
B2Y 4A2

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Foreword

The purpose of this proceedings is to archive the activities and discussions of the meeting, including research recommendations, uncertainties, and to provide a place to formally archive official minority opinions. As such, interpretations and opinions presented in this report may be factually incorrect or mis-leading, but are included to record as faithfully as possible what transpired at the meeting. No statements are to be taken as reflecting the consensus of the meeting unless they are clearly identified as such. Moreover, additional information and further review may result in a change of decision where tentative agreement had been reached

Avant-propos

Le présent compte rendu fait état des activités et des discussions qui ont eu lieu à la réunion, notamment en ce qui concerne les recommandations de recherche et les incertitudes; il sert aussi à consigner en bonne et due forme les opinions minoritaires officielles. Les interprétations et opinions qui y sont présentées peuvent être incorrectes sur le plan des faits ou trompeuses, mais elles sont intégrées au document pour que celui-ci reflète le plus fidèlement possible ce qui s'est dit à la réunion. Aucune déclaration ne doit être considérée comme une expression du consensus des participants, sauf s'il est clairement indiqué qu'elle l'est effectivement. En outre, des renseignements supplémentaires et un plus ample examen peuvent avoir pour effet de modifier une décision qui avait fait l'objet d'un accord préliminaire

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Abstract

These proceedings record discussions that were held during the Regional Advisory Process (RAP) meetings for Scotian Shelf Snow Crab stocks in Maritimes Region on January 30-31, 2002. The scientific peer review of Eastern Nova Scotia Snow Crab and Southwestern Nova Scotia Snow crab was conducted. The discussions from this meeting are presented in this document.

Résumé

Le présent compte rendu relate les discussions tenues pendant les réunions du Processus consultatif régional (PCR) portant sur les stocks de crabe des neiges du plateau néo-écossais, dans la Région des Maritimes, les 30 et 31 janvier 2002. Lors de ces réunions, on a procédé à un examen scientifique par les pairs de l'état des stocks de crabe des neiges de l'est de la Nouvelle-Écosse et du sud-ouest de la Nouvelle-Écosse; les discussions auxquelles il a donné lieu sont présentées ici.

INTRODUCTION

The meeting were held the Mic Mac Amateur Aquatic Club, Dartmouth, 30-31 January 2002. The Invitation letter and list of Invitees are in Appendix 1 and 2. The Chairman, René Lavoie, welcomed the participants (Appendix 3), explained the procedure for the meeting, the specific role of scientific referees, industry representatives and observers, and reviewed the agenda

The Chairman further explained that the objective of the meeting was to conduct a thorough peer review of the stock assessments presented by biologist-in-charge Michel Biron with input from representatives of the province of Nova Scotia and from the industry. He also clarified that the RAP was NOT the place to discuss management considerations

In these proceedings, summaries of presentations and comments from referees are the work of the authors and have been reproduced with little or no editing.

SUMMARY OF PRESENTATIONS

Presentation on Temperature Conditions in Snow Crab Areas

K.F. Drinkwater

Temperature conditions during 2001 were presented for the snow crab fisheries management areas on the northeastern Scotian Shelf and Sydney Bight. Extensive geographic coverage of bottom waters were available from the annual DFO snow crab (April-October) and groundfish (July) surveys and additional information was obtained from other fisheries surveys, monitoring activities and research studies. Bottom temperatures within the snow crab fishing areas of the northeastern Scotian Shelf were generally colder-than-average in 2001. This reversed the warmer-than-average conditions of the previous two years and the gradual-warming trend that had been observed since the mid-1990s. A snow crab habitat index, defined by the area of the bottom covered by waters between -1° to 3°C, was calculated for the northeastern Scotian Shelf (Areas 23 and 24) and Sydney Bight (Areas 20-22) based upon the groundfish survey. The northeastern Scotian Shelf habitat index increased sharply to above its long-term mean, reversing the declining trend of the past 4 years. On Sydney Bight the habitat index was near its long-term average value and similar to that recorded in 2000. In both regions the average temperature within the area of bottom covered by the -1° to 3°C declined significantly. Monthly and annual vertical temperature profiles for the different snow crab areas typically showed colder-than-average conditions in the subsurface waters (deeper than 50 m) with a tendency towards warmer conditions in the beginning of the year and cooler in the second half of the year. In contrast, the surface temperatures, where the snow crab larvae reside, were significantly warmer than the long-term mean throughout most of the year. Similar to the bottom temperatures, the subsurface temperatures on the northeastern Shelf reached values that had been typical of the cold period from the early to mid-1990s and contrast with the warm conditions of 2000. In summary, cold conditions as evidenced by subsurface and near bottom temperatures and the increased area of the bottom covered by cold (-1° to 3°C) water dominated the snow crab management areas on the northeastern Scotian Shelf and Sydney Bight in 2001.

The origin of the cold water in 2001 does not appear to be from atmospheric cooling but was most likely advected into the region from the Gulf of St. Lawrence. Early reports suggest a slug of cold water from off the Labrador entered the Gulf through the Strait of Belle Isle in late 2000 or early 2001 and was transported anticlockwise around the Gulf before exiting through Cabot Strait. Confirmation of this will require further study.

The crabs caught during the annual snow crab survey on the Scotian Shelf were found in colder waters in 2001 than in 2000, which is believed to largely reflect the temperature ranges available to them in the two years. The crabs were caught in the same depth ranges in both years.

Area-Swept Estimation
Tobie Surette

Using data gathered during the 2001 Southern Gulf-Scotian Shelf trawl surveys, an area-swept estimation procedure was proposed. The data were gathered using a Minilog depth-temperature probe and Netmind acoustic sensor system, both synchronized and combined with position data from the GPS system.

The general model used was that of a definite integral between touchdown and lift-off trawl times of an instantaneous area-swept variable (the surface area covered per unit time). The latter was calculated as being the trawl width times the trawl speed at a given time.

Various aspects of data pre-processing, such as smoothing of trawl speed, outlier detection, and filtering of the trawl width time series were discussed. The problem of accurate touchdown and lift-off time determination was also discussed and a novel analytical method using mixture model clustering was using in our particular case.

SUMMARY OF COMMENTS FROM SCIENTIFIC REFEREES

Ghislain Chouinard

Comments on 'Assessment of the 2001 snow crab fishery off eastern Nova Scotia (Areas 20 to 24)' by Biron et al.

Generally, I found the document to provide a very good and detailed description of the fishery, methods and results of the assessment of snow crab stocks in eastern Nova Scotia. The authors are to be complimented for the amount of information that has been gathered. The document could be improved by having clearer conclusions about the state of the resource and particularly prospects over the next few years.

I noted that the CPUE and trawl survey indices do not appear to coincide in terms of recent abundance trends. The CPUE index increases rapidly over the recent time period. Many reasons are given for the potential increase including a progressive change in trap type used in

the fishery. It appears that the new traps may be as much as 5 times more efficient (see 4X paper) than the former gear. This could explain a large portion of the apparent trend in CPUE. Other factors (e.g. areas, season) are also mentioned as potentially affecting the CPUE series. No attempt was made at standardizing the CPUE series. Standardization of the CPUE series could account for these sources of variation and should be conducted if the CPUE is to be used as an abundance index. There are several methods available but the use of GLM should be investigated. In summary, standardization of the CPUE may resolve (at least partly) the apparent discrepancy between the two abundance indices.

Sampling: It is mentioned in the text that no weighting is applied in the combination of length frequency samples collected by observers (p.10). This should be rectified.

The annual trawl survey has been evolving since its inception in 1997 to the point where there is not a consistent time-series available. It would be important that the area of the survey and other design considerations be fixed as soon as possible so that the index is consistent from one year to the next. An index covering the same areas since 1997 would be useful in looking at the general trend. The impact of the mask of zeros used for the estimation should be examined. If it simply result in a scaling factor then its usefulness is limited if the survey is used as a relative index. The change in vessel and extended period of the survey introduces some uncertainty for the 2001 survey.

For the northern area, a survey was conducted in September in 2001 and it is now proposed that the latter be used to determine exploitable biomass, hence changing the basis of the assessment over previous years and resulting in a higher biomass estimate. The rationale for using this survey was that recruitment was detected. The change may be valid but the survey will need to be examined for its coherence. Again, the basis for the assessment should be fixed as soon as possible.

In my view, the outlook for this fishery in both the northern and southern areas over the next few years is not bright. Given the significant decline in recruitment in the trawl survey, one can expect that exploitable biomass would decline significantly in 2002 if catch levels of recent years are maintained. Since a large portion of the participants in the fishery have now switched to the most efficient traps, this would result in a decline in catch rates in 2002. The biomass would decline further in 2003 (possibly dramatically) and thereafter as there appears to be little recruitment. It should be noted that this conclusion is based on the data taken at face values. There are uncertainties with the 2001 survey, however, a general decline is anticipated over the next few years.

Peter Koeller

Comments on 'Assessment of the 1999/2000 and 2000/2001 snow crab fishery off southwestern Nova Scotia (NAFO Div. 4X)' by Biron et al.

The document provides a good description of the fishery in the area. The comments made for the eastern Nova Scotia snow crab concerning catch rates and sampling equally apply to this paper.

In addition, it is noted that there are a number of sources of information that could be examined include the groundfish survey results where length frequencies have been measured over the last few years. Given the apparent lower potential of these areas for snow crab, this may be sufficient to provide advice. In addition, the potential of using shrimp traps to provide indices of pre-recruit abundance should be explored.

In summary, there is little basis for the assessment given the concerns with the CPUE series. Table 6 (p. 19) shows the difference in efficiency of the two trap types. The ratio is about 5 between the tow and consistent over the two years over which it was calculated. Again, an investigation of standardization of the CPUE time series is recommended.

Comments are made specifically on the SSR, but may affect the Res. Doc. as well. 4. A general comment on both Res. Docs, however is that descriptions concentrate too much on the present and previous year's stats, which makes it difficult or impossible to place the current year into the long term context and to detect trends.

Comments Specific to 4X (Southwestern Nova Scotia)

1. The "background" section of the SSR contains only information on biology. In contrast, the background for the ENS SSR contains only information on the fishery. Since these documents are supposed to stand by themselves, each should cover both types of information.

2. The last 2 bullets of the SSR are related to environment and should be combined. Suggest: SWNS is at the southern limit of snow crab distribution and environmental conditions, especially temperature, are not favourable for a large or sustainable population. Bottom water temperatures are becoming less favourable. In the text you could point to similarities in the shrimp fishery.

3. There should be a bullet which gives some guidance to managers - e.g. this fishery has probably reached its potential under current environmental conditions and further expansion is not recommended at this time.

4. There should be some attempt to standardise CPUE within gears, areas, times to see if there is some way of using this data for abundance. As is, and as with the ENS SSR, the CPUE would be better place in the fishery section as a measure of "fishery performance".

5. There is considerable amount of speculation on the sources of recruitment from ENS, with no evidence. There is however evidence of local recruitment. These statements should be qualified, although worth considering as a "possible" factor.

6. The section on Environmental Factors should concentrate on the small areas of cold water which snow crab inhabit, rather than the general oceanography of the area. A graph of temperature trends should be added to support the statements of changing environmental conditions. Also update to 2001.

7. Why were catches so low in 94-96 despite relatively high effort? What is different since 1998? Learning? Different fishing grounds? This is a good example of the difficulty in using CPUE for abundance and could e highlighted.

8. I find the discussion and use of both calendar and seasonal stats confusing - use one or the other and don't bother telling us why.

Comments Specific to Eastern Nova Scotia

1. This SSR also needs a bullet on management direction - steady as she goes but watch out in the future. Suggest you try to put a time frame on when one might start seeing decreases in catch rates.

2. The first bullet on decreasing recruitment could also mention the decrease in females which is an alarming development that needs to be highlighted.

3. Replace the map on the first page with the first map on page 3.

4. Same as #4 in 4X above. Note however, the striking similarity of long term trend of CPUE in 23-24 with shrimp CPUE in the same area. The shrimp CPUE is same as RV vessel data and so is considered a change in abundance.

5. p. 3 remove second from last sentence.

6. Probably too much information on trawl survey methodology, especially problems, area covered, computation steps, that are best left for Res. Doc. The survey timing difference is the main concern.

7. Would prefer "biomass available for the fishery" and "potential exploitable biomass" used in various places to be changed to "trawlable biomass" of "fishable biomass"

8. On p. 6 there should be 2 additional graphs, one for the north and one for the south, that give the survey abundance estimates for adult males, females and adolescents.

9. Be careful about the use of the terms "absolute" and "relative" as discussed in the meeting. e.g. under sources of uncertainty you say "These relative indices should not be taken as absolute numbers". In fact, you are taking them as absolute numbers in your

assessment/management framework, and they are probably as close to absolute as any biomass survey will ever get. I suggest you avoid the use of either term.

10. Statements on environmental factors made for 4X (# 6) also holds for the ecosystem considerations section in this SSR. Use same heading for both?

11. Note that many SSRs now include the traffic light summary table - I don't think your's is ready for that - the table needs to be expanded to include other indicators (e.g. female abundance) and set limits. Try using Jerry Black's software for this

12. The females data needs to be in the research document.

13. As I general statement, I feel you need to pay more attention to ensuring the comparability of the survey from year to year, and less on perfecting the "absoluteness" of the annual biomass estimate.

John Tremblay

Comments on Biron et al. Assessment of 1999/2000 & 2000/2001 snow crab fishery off southwestern Nova Scotia

- include yet another factor affecting CPUE – change in regulations allowing a stone crab bycatch
- Indicate whether all traps are used (is there "unused effort"?)

Comments on Biron, et al. Assessment of 2001 snow crab fishery off eastern Nova Scotia (Areas 20-24)

Overall – This assessment has come a long way since my involvement & I congratulate Michel, Mikio and their team as well as the industry for their involvement. Not only is there a trawl survey in place, but the fishery data have been expanded considerably with at-sea observers.

I have a number of questions/concerns about the data interpretation. In particular it seems there is a de-emphasis of the data on incoming recruitment from the trawl survey. I may be missing something but think it would be very useful to put the decreasing trend in recruitment into some sort of perspective. At the same time there is considerable weight given to the commercial CPUE data but no detailed analysis of what might be affecting it (e.g. soak time, trap type?,

Some other general questions/comments:

- Regarding the stock status…are there any other indicators of stock health that might be developed? E.g. female fertilization rate
- No estimates of exploitation rate?

Some comments are written on the manuscript. I could have spent more time on the editorial part but chose to spend more time on the scientific issues

Introduction
At the risk of seeming self-serving---it would be helpful to refer to Tremblay, Eagles & Elner 1994 tech rept for early history of the fishery

"landings not more than 0-10% soft-shell crabs;" – is this checked? Enforced?

Methods
- Provide % of landings represented by "properly completed logs"
- What are assumptions of catch-effort-based methods? Need to elaborate here [or pull this section since nothing is made of estimates – see below

Annual Trawl Survey
- stations originally randomly selected. Give some indication of what % were rejected because the bottom was not trawlable
- PHA – what are the masks for the non-commercial categories & what are they based on?
- Size frequencies are densities prior to krigging – how would they be expected to change if expanded to abundances?
- Re masks – doesn't new mask include areas that have snow crab e.g. slope

Annual Groundfish Survey
- Credit where credit is due…it is just the Marine Fish Division that has conducted the survey

Results
- Fishery results reported thoroughly

Biomass estimates in CFAS 21/22 from catch/effort
- Need more detail here [but doesn't seem to be used…]
- If based on small local areas show the CPUE data that are used, preferably in a graph

Annual Trawl Survey
- Indicate on one of the charts what the kriging surface is (connect the outer stations?)
- How has the station coverage changed over time & how has this affected annual biomass estimates?
- Possible to have a table showing mean no per trawl by category?
- Why no estimates of juvenile and adolescent biomass (just density presented)

Discussion
Need to consider:

- Apparent disagreement between survey trends and CPUE – biomass in both CFA 20-22 remained the same from 2000 to 2001 yet CPUE increased by 28-50% (Northern)
- In CFA 23-24 biomass decreased by 11% but CPUE remained the same or increased (15% in 24)
- Different masks for adults vs juveniles?
- Comment about the huge decline in recruitment over the last 4 years? i.e. for SE NS looks like adolescent crabs 60-95 mm CL have decreased at least 8-fold since 1997

Change "Annual Effect" to "Effect of survey timing on annual biomass estimates"

Re large areal expansion of fishery – concerns about exploiting portion of the population that was untouched in the past i.e. broodstock??

COMMENTS FROM OTHER PARTICIPANTS

Comment on Crab Distribution

Q :David Rambeau (CFA 20 temp. and rep for core non-adjacent CFA 23)
-You stated at other meetings that the southern limit of distribution was at the 24 / 4X line. Now you say it's W. of the 24 line (Lahave).
A :M. Moriyasu
-This is the S. most commercially exploitable fishery. Maybe crab are present off the coast of Maine, but not commercially.

Comments on Assessment Technical Workshop in St. John's, Nfld.

M. Moriyasu :
-Nfld., Laurentian, Gulf / ENS all have different assessment techniques.
-Recommendations- we have used biomass estimates as absolute, but they shouldn't be considered as absolute, but rather as an index of abundance, because :
-1st point - natural mortality rate is unknown. Biomass can be overestimated by not accounting for natural mortality.
-2nd point – catchability of trawl (assumption is 100%)
-Ignoring these two factors, we cannot use these estimates as absolute.

Comments on Vessel Survey

Q : O. Burke
-2001 is a concern when it comes to the survey. Different time frames for different vessels. I'm concerned with the different vessels. The gear will react differently with the different boats.
A : M. Moriyasu
-I do not think the different vessels is a factor
B. Anderson
-Including new stations this year, that you didn't use last year, does this effect your results?
E. Wade
-It is difficult to compare one year to the next.
B. Anderson
-Factors affecting survey (3 different vessels, fishery at the time of the survey, new stations)
E. Wade
-We're trying to do a better job, we're evolving.
M. Moriyasu
-Maybe question is are we overestimating or underestimating biomass?
E. Wade
-I don't think we are creating a bias. Calculations are comparable from one year to the next.
B. Osborne
-Survey after fishery would take away some problems due to mortality, lag time, and recruitment differences.
M. Moriyasu
-Timing of survey -- if done in fall, we may not be able to get it completed, due to weather.
-Fishing season going into Sept. is too long, and maybe changed.
-Ideally, survey should be after fishery.

Comments on Fall Survey

Q : G. Chouinard
-Why did you conduct this survey in the fall?
A : M. Moriyasu
-Based on discussions with fishers, we decided at last year's RAP, that the spring was not the ideal time for the survey, so we decided to modify and try at different times.
G. Chouinard
-Consistency in the survey is a good thing and there is some validity in the spring survey.
M. Biron
-The spring survey does look valid, especially for the commercial crab.

Comments on Catchability

M. Moriyasu
-No catchability study done in Moncton so far.
-Bottom type is a big factor.
-Catchability is not high when you look at smaller sizes.

-We want to do a catchability study this year.
-There is selectivity in 40mm size.
-Certain size classes may be in areas untrawlable by trawl survey (inshore areas, fishers catching crab in their lobster traps).

Comment on Catch Rate and Female Abundance as Predictors

G. Chouinard
-Things seem to have remained stable when you look at the size frequencies from just before legal size and including all commercial size, until this year. No recruits coming.
-Catch rate (it's not reasonable to have a 5 fold increase in the catch rate, just by changing the trap type).
-It should decline this year or next. It shouldn't last, based on size frequencies from the trawl survey.
-Bit concerned.
M. Moriyasu
-CPUE, close to collapse situation (as it was in Glf.), tends not to show the trend until it actually collapses.
-In the Gulf, we saw no sign of change, so the same quota was kept (89 / 90), then the fishery collapsed the following season.
-The trend in ENS is totally normal, same as it was in the Gulf.
-Fluctuations are similar to Southern. Gulf.
-This stock may decrease very quickly in the future
-Crab could become old carapace crab (not good for section market)
-One approach is to fish hard while abundance is there and quality is there.
-The main problem is reproductive potential. We need to leave a certain abundance on the bottom.
-Mature females are not there
-If there is not a lot of mature females, then why should we leave categ. 3 and 4 males to reproduce with them ?
M. Eagles
-If females are dying out, (they are getting older) then we should see a lot of barren females. Are there a lot of barren females found?
P. Kehoe
-There were no females found when we searched for females. This could go back quite a few years (this gap in recruitment) because of the lack of females.
Gordon. MacDonald (area 23)
-Exceptional work done by snow crab group.
-Charts concerning female population show a drastic decline.
-This should be in the traffic light approach.
-All this data was taken in 2001, but applied to 2002 (one year behind)
-As Mikio implied, the CPUE is not indicative of the stock status.
-Could the female population and the decrease be mentioned in the document ?

Comments on Crab Larvae

Q : P. Kehoe
-Do we know the percentage of females in crab larvae?
A : M. Moriyasu
-We assume its 50%. Females carry between 20,000 and 120,000 eggs (mortality rate is approx. 99.9%).

Comments on Fishing Season and Incidence of Soft-Shell Crabs

Q : B. Osborne
-How far back can the fishing season be placed? This to avoid the incidences of large percentages of soft shelled crab in the catches.
A : M. Moriyasu
-Mating season is late winter, and again in late May.
Fishery is usually good in April (SGlf.) then decreases in late May.
M. Eagles
-We are getting more and more soft crab towards the end of Sept.. Shouldn't these crab be hardened up by this time? Soft shelled is based on durometer, < 68, two months earlier (July) would be the time they are molting. This doesn't seem correct for time period of molting crab.
M. Moriyasu
-Fishers fish-out the hard shell crab, at the end of season there is more opportunity for soft shell to enter the trap.
-It takes 4 months, not 2, for crab to harden close to 68 durometer units.

RESEARCH RECOMMENDATIONS

South West Nova Scotia (4X)

The existing annual snow crab trawl survey that cover fishing grounds up to the 4W/4X demarcation line in eastern Nova Scotia should be extended to at least cover the LaHave fishing grounds in southwestern Nova Scotia. This would give a relative abundance index not related to fishery data, as well as evaluate the population size of future recruits.

PARTICIPANT SURVEY ON THE DARTMOUTH VENUE AND MEETING

In response to comments from industry about the venue in Dartmouth instead of Moncton, a survey of participants was conducted, using a standard form (Appendix 5) to give everyone an opportunity to express views on the subjects of separate or combined meeting with the Gulf, and on meeting location in Dartmouth vs Moncton.

From the 32 forms returned, 27 people expressed views on the venue; of these, 22 people (81.5%) supported the separate venue in Dartmouth and 5 people (18.5%) preferred the combined format in Moncton. A few participants suggested a venues closer to Cape Breton if it can be conveniently arranged.

Appendix 1. Letter of Invitation

Gulf Region
Science Branch
P.O. Box 5030
Moncton, NB E1C 9B6

January 16, 2002

Distribution

Subject: Peer review of snow crab stocks

You are invited to participate at the assessments of snow crab on the Scotian Shelf which will be reviewed at the MicMac Amateur Aquatic Club, 192 Prince Albert Road, Dartmouth, N.S., January 30-31, 2002 (please see attached schedule).

This meeting will provide estimates of snow crab abundance and biomass for the northern (Areas 20, 21 and 22) and southern (Areas 23, and 24) portions of eastern Nova Scotia.

The purpose of this meeting is to conduct a thorough peer review of the stock assessment. Your participation is required to ensure that the review is of the highest quality

Scientists will provide a brief overview of their assessments that should include the main conclusions, the supporting evidence, any new methods, and major limitations. The presentation will be followed by comments from any of the scientific referees and then from the invited industry participants.

Finalised stock status reports will be prepared at the meeting. The minutes of this meeting will be published as proceedings.

We greatly appreciate your contribution to this valuable exercise and look forward to seeing you in February.

Région du Golfe
Direction des sciences
C.P. 5030
Moncton (N.-B.) E1C 9B6

le 16 janvier 2002

Liste de diffusion

Objet : Examen par les pairs des stocks de crabe des neiges

Nous vous invitons à participer à l'examen des rapports d'évaluation des stocks de crabe des neiges du plateau néo-écossais qui aura lieu au MicMac Amateur Aquatic Club, 192 route Prince Albert, Dartmouth, N.-É., du 30 au 31 janvier 2002 (voir l'horaire ci-joint.)

Cette réunion a pour but de fournir les estimations de l'abondance et de la biomasse du crabe des neiges dans la région nord (zones 20, 21 et 22) et sud (zones 23 et 24) de l'est de la Nouvelle-Écosse.

L'objet est de réaliser un examen exhaustif par les pairs de l'évaluation de ces stocks. Pour que l'examen soit de la plus haute qualité possible, votre participation est essentielle.

À la réunion, les scientifiques présenteront un résumé des résultats de leurs évaluations, qui devrait comprendre les principales conclusions, les preuves à l'appui, les nouvelles méthodes utilisées et les limites importantes. Leur survol sera suivi d'observations des examinateurs scientifiques, puis des participants invités de l'industrie.

La version définitive des rapports sur l'état des stocks sera préparée à la réunion. Le compte rendu de la réunion sera publié dans les actes.

Nous vous remercions beaucoup de votre apport à cette activité importante. Au plaisir de vous voir en février.

René Lavoie
Division Manager, Invertebrates Fish Division / Gestionnaire de Division, Division des Invertébrés
Maritime Region / Région des Maritimes

Peer Review of Snow Crab Stocks/
Examen par les pairs des stocks de crabe des neiges

MicMac Amateur Aquatic Club, Darthmouth, N.S./N.-É.

January 30-31, 2002 / du 30 au 31 janvier 2002

Proposed timetable / Horaire proposé

Eastern Nova Scotia / L'Est de la Nouvelle-Écosse

January 30 / le 30 janvier	***Time / Horaire***	***Lead / Responsable***
Introduction	09:00 -09:30 hrs *de 9h00 à 9h30*	R. Lavoie
Environmental conditions/ eastern Nova Scotia / *Conditions environnementales/ L'Est de la Nouvelle-Écosse.*	09:30 -10:15 hrs *de 9h30 à 10h15*	K. Drinkwater
Swept surface estimation from trawl stations / Estimation de la surface balayée des stations de relevé au chalut	10:30 -11:00 hrs *de 10h30 à 11h00*	T. Surette
Snow crab. Area 4X/ Presentation and discussion / *Crabe des neiges, zone 4X/ Présentation et discussion*	11:00 – 12:00 hrs *de 11h00 à 12h00*	M. Biron
Snow crab. Areas 20-24/ Presentation and discussion / *Crabe des neiges, zones 20 à 24/ Présentation et discussion*	13:15 -15:00 hrs *de 13h15 à 15h00*	M. Biron
SSR/ Areas 20-24. and 4X *RÉS/ zones 20 à 24, et 4X*	15:15 -16:30 hrs *de 15h15 à 16h30*	R. Lavoie
January 31 / le 31 janvier	***Time / Horaire***	***Lead / Responsable***
SSR/ Areas 20-24. and 4X *RÉS/ zones 20 à 24, et 4X*	09:00 -11:00 hrs *de 9h00 à 11h00*	R. Lavoie
Conclusion.	11:00 -11:30 hrs *de 11h00 à 11h30*	R. Lavoie

Appendix 2. List of Invitees

Peer Review of Snow Crab Stocks
January 30-31, 2002
Bedford Institute of Oceanography, Dartmouth / Examen par les pairs des stocks de crabe des neiges
Du 30 au 31 janvier, 2002
Mic Mac Aquatic Amateur Club, Dartmouth

Eastern Nova Scotia Participants

Chairperson/ Président

René Lavoie
Division Manager.
Invertebrate Fish Division
Bedford Inst.of Oceanography
P.O. Box 1006
Dartmouth, NS B2Y 4A2
Tel: (902) 426-2147
E-mail: lavoier@mar.dfo-mpo.gc.ca

Scientific Referees/
Examinateurs scientifiques

Ghislain Chouinard
Division Chief
Aquatic Resources Division
P.O. Box 5030
Moncton, NB E1C 9B6
Tel: (506) 851-6136
Fax: (506) 851-2387
E-mail: ChouinardG@dfo-mpo.gc.ca

Michel Comeau
Aquatic Resources Division
P.O. Box 5030
Moncton, NB E1C 9B6
Tel: (506) 851-6136
Fax: (506) 851-2387
E-mail: comeaum@dfo-mpo.gc.ca

Peter Koeller
Invertebrate Fisheries Division, Science Branch
Bedford Inst.of Oceanography
P.O. Box 1006
Dartmouth, NS B2Y 4A2
Tel: (902) 426-5379
E-mail: koellerp@mar.dfo-mpo.gc.ca

John M. Tremblay
Invertebrate Fisheries Division
Bedford Inst.of Oceanography
P.O. Box 1006
Dartmouth, NS B2Y 4A2
Tel: (902) 426-3986
E-mail: tremblayj@mar.dfo-mpo.gc.ca

Science Participants/
Participants scientifiques

Ken Drinkwater
Bedford Inst. of Oceanography
P.O. Box 1006
Dartmouth, NS B2Y 4A2
Tel : (902) 426-2650
Fax : (902) 426-7827
Email: Drinkwaterk@mar.dfo-mpo.gc.ca

Provincial Governments/
Observateurs du
gouvernement

Bruce Osborne
NS Department of Fisheries & Aquaculture
P.O. Box 2223
Halifax, NS B3J 3C4
Tel: (902) 424-0352
Fax: (902) 424-4671
Email: osborneb@gov.ns.ca

DFO
Managers/Gestionnaires du
MPO

Michael Eagles
Fisheries and Oceans Canada
Bedford Inst.of Oceanography
P.O. Box 1006
Dartmouth. NS B2Y 4A2
Tel: (902) 426-7198
Fax: (902) 426-9683
Email: Eaglesm@mar.dfo-mpo.gc.ca

Fishermen's Association Representatives/ Representants des associations des pêcheurs

Bob Anderson +1
Rep.. Area / Zone 24
720 Queen St.
P.O. Box 251
Canso NS B0H 1H0
Tel/ Fax: (902) 366-2391

Timothy S. Bagnell +1
Rep.. Area / Zone 23
P.O. Box 7. Louisbourg
NS B0A 1M0
Tel: (902) 733-2864
Fax: (902) 733-2042

Nellie Baker Stevens +1
Eastern Shore Fisherman's Protective Assoc.. Zone 24
P.O. Box 55
Musquodoboit Harbour
NS B0J 2L0
Tel: (902) 889-2564
Fax: (902) 889-2633
Esfpa@ns.sympatico.ca

David Burchell +1
Rep.. Area / Zone 20
Box 106 Dingwall
NS B0C 1G0
Tel : (902) 383-2460

Pat Fougere +1
Canso Trawlermens Coop..Rep. Area / Zone 24
P.O. Box 362
Canso / Guys. Co.
NS B0H 1H0
Tel: (902) 366-2359
Fax: (902) 366-2804
Email: caperyan@hotmail.com

Donny Hart +1
Rep.. Area / Zone 24
5 Merry Rd.. Halifax Co.
N.S. B3V 1E9
Tel: (902) 868-2140
Fax: (902) 868-2596
Email: samfish@net.com.ca

Bill Hutt +1
East Cape Breton Fish. Assoc.
7554 Main St.
Louisbourg. NS
B1C 1J4
Tel: (902) 733-2261
Fax: (902) 733-2261

Josephine Kennedy +1
Rep.. Area / Zone 23
Box 5602
Louisbourg. NS
B1C 2L8
Tel: (902) 733-2741
Fax: (902) 733-2407
Email: jo@ns.sympatico.ca

Peter King
Rep.. Area / Zone 23
139 Eagle Creek Rd.
West Bay NS B0E 3K0
Tel: (902) 345-2012
Fax: (506) 561-0101
Email: peterking@hotmail.com

Merril MacInnis +1
Rep.. Area / Zone 21
Box 53. RR1.
Englishtown. Vict. Co.. NS
B0C 1H0
Tel: (902)-929-2309
Fax: (902)

Allan MacInnis
Rep.. Area / Zone 22
Box 53. RR1.
Englishtown. Vict. Co.. NS
B0C 1H0
Tel: (902)-929-2477
Fax: (902) 929-2710
Email: allan.m@ns.sympatico.ca

Neil P. MacMullin
Rep., Area / Zone 22
28 Lamond St.
Sydney Mines, NS B1V 1V9
Tel: (902) 736-2048

Herb Nash +1
Rep., Area / Zone 23
Wadman St.
Glace Bay, NS
B1A 1S4
Tel: (902) 849-1813
Fax: (902) 842-9635

Patricia Rhynold +1
Guysborough County Inshore
P.O. Box 98, Canso
NS B0H 1H0
Tel: (902) 336-2460
Fax: (902) 366-2987
e-mail: patrhynold@ns.sympatico.ca

Ervin Touesnard +1
Rep., Area / Zone 24
RR#1 River Bourgeois
Richmond Co.
NS B0E 2X0
Tel: (902) 535-2068
Fax: (902) 535-2068

Osbourne Burke +2
Federation of Gulf N.S. Groundfish Fishermen
P.O. Box 130
Ingonish, NS B0C 1K0
Tel: (902) 285-2276
Fax: (902) 285-2099

Experimental work
Science guest

Paul Kehoe
942 Rocky Bay Rd
Richmond Co., NS
B0E 1K0

Malcom MacDonald
9409 Fourchu
St. Peter's Rd. Fourchu
N.S., B2J 1A9

First Nation representatives/
Représentants des première nations

Kara Paul +1
Aboriginal Fish Serv. Biologist
4123 Shore Rd.,
ESKASONI NS
B0A 1J0
Tel : (902) 379-2024
Fax : (902) 379-2159
paulks@mar.dfo-mpo.ca

Tim Martin +1
Native Council of NS

DFO Science Gulf Region/MPO Science Région du Golfe

Department of Fisheries and Oceans
Gulf Region Science Branch
Snow Crab Section
P.O. Box 5030 Moncton
N.B. E1C 9B6
Fax : (506) 851-3062

Mikio Moriyasu : moriyasum@dfo-mpo.gc.ca
Elmer Wade : Wadee@dfo-mpo.gc.ca
Marcel Hébert : Hebertm@dfo-mpo.gc.ca
Michel Biron : Bironm@dfo-mpo.gc.ca
Pierre DeGrâce : Degracep@dfo-mpo.gc.ca
Robert Campbell : Cambellr@dfo-mpo.gc.ca
Rita Gautreau : Gautreaur@dfo-mpo.gc.ca
Luc Savoie : Savoiel@dfo-mpo.gc.ca
Tobie Surette : Surettetj@dfo-mpo.gc.ca

Appendix 3. Agenda

1. Introduction (René Lavoie).
2. Environmental conditions /eastern Nova Scotia (Ken Drinkwater, BIO).
3. Swept surface estimation from trawl stations (Tobie Surette, GFC).
4. Presentation of draft research document (RD) and stock status report (SSR) on snow crab in southwestern Nova Scotia (4X) (Michel Biron, GFC).
5. Presentation of draft research document (RD) and stock status report (SSR) on snow crab in eastern Nova Scotia (Michel Biron, GFC).
6. Comments by external reviewers, Peter Koeller and John Tremblay (BIO, Dartmouth), Ghislain Chouinard (DFO, Moncton).
7. Comments by Fisheries Management, industry, and provincial government representatives.
8. Review of the SSR for southwestern Nova Scotia (4X).
9. Review of the SSR for eastern Nova Scotia.

Appendix 4. List of Participants

Person	Location	Mailing Address	Telephone	Fax	E-mail
Chairperson/ Président					
Lavoie, René	Division Manager, Invertebrate Fish Division Bedford Inst.of Oceanography	P.O. Box 1006 Dartmouth, NS B2Y 4A2	(902) 426-2147	(902)	lavoier@mar.dfo-mpo.gc.ca
Scientific Referees/Examinateurs scientifiques					
Chouinard, Ghislain	Division Chief Aquatic Resources Division	P.O. Box 5030 Moncton, NB E1C 9B6	(506) 851-6220	(506) 851-2620	ChouinardG@dfo-mpo.gc.ca
Koeller, Peter	Invertebrate Fisheries Division Science Branch Bedford Inst.of Oceanography	P.O. Box 1006 Dartmouth, NS B2Y 4A2	(902) 426-5379	(902) 426-1862	koellerp@mar.dfo-mpo.gc.ca
Tremblay, John M.	Invertebrate Fisheries Division, Science Branch Bedford Inst.of Oceanography	P.O. Box 1006 Dartmouth, NS B2Y 4A2	(902) 426-3986	(902) 426-1862	tremblayj@mar.dfo-mpo.gc.ca
Science Participants/Participants scientifiques					
Drinkwater, Ken	Bedford Inst. Of Oceanography	P.O. Box 1006 Dartmouth, NS B2Y 4A2	(902) 426-2650	(902) 426-7827	Drinkwaterk@mar.dfo-mpo.gc.ca
ProvincialGovernments/Observateurs du gouvernement					
Osborne, Bruce	NS Department of Agriculture & Fisheries	5151 George Street Halifax, NS B3J 3C4	(902) 424-0352	(902) 424-1766	osbornbd@gov.ns.ca
DFO Managers / Gestionnaires du MPO					
Eagles, Michael	Fisheries and Oceans Canada Bedford Inst.of Oceanography	P.O. Box 1006 Dartmouth, NS B2Y 4A2	(902) 426-7198	(902) 426-9683	Eaglesm@mar.dfo-mpo.gc.ca
DFO Science Gulf Region/MPO Science Région du Golfe					
Moriyasu, Mikio	Department of Fisheries and Oceans, Gulf Region Science Branch, Snow Crab Section	P.O. Box 5030 Moncton N.B. E1C 9B6	(506) 851-6135	(506) 851-3062	moriyasum@dfo-mpo.gc.ca
Biron, Michel			(506) 851-6046		Bironm@dfo-mpo.gc.ca

Campbell, Robert			(506) 851-6457		Cambellr@dfo-mpo.gc.ca
DeGrâce, Pierre			(506) 851-2005		Degracep@dfo-mpo.gc.ca
Landry, Rita			(506) 851-6890		LandryRL@dfo-mpo.gc.ca
Savoie, Luc			(506) 851-6046		Savoiel@dfo-mpo.gc.ca
Surette, Tobie			(506) 851-3378		Surettetj@dfo-mpo.gc.ca
Wade, Elmer			(506) 851-6210		Wadee@dfo-mpo.gc.ca

First Nation Representatives

Martin, Tim	Netukalimkewe'l Commission	P.O. Box 1320 Truro. N.S. B2N 5N2	(902) 895-7050	(902) 895-8182	Netcomm@ncnsnetcomm.ns.ca
Paul, Kara	Eskasoni Fish & Wildlife Commission	4123 Shore Rd.. ESKASONI NS. B0A 1J0	(902) 379-2024	(902) 379-2159	Kara_s_paul@hotmail.com
Paul, Lance (Observer)	Membertou	111 Membertou Street Sydney. N.S. B1S 2M9	(902) 567-2018	(902) 567-0933	lancepaul@membertou.ca
Poulette, Bill (Observer)	Eskasoni Fish & Wildlife Commission	4123 Shore Rd.. Box 7329 ESKASONI NS. B1N 1A4	(902) 379-2024	(902) 379-2159	pla_mu@Foy.NSTN.ca

Fishermen's Association Representatives/ Representants des associations des pêcheurs

Anderson, Robert	Rep.. Area / Zone 24 **Permanent**	720 Queen St. P.O. Box 251 Canso NS B0H 1H0	(902) 366-2391	(902) 366-2391	casi.anderson@ns.sympatico.ca
Bagnell, Timothy S.	Rep.. Area / Zone 23 Permanent	P.O. Box 7. 7522 Main Street. Louisbourg. NS B0A 1M0	(902) 733-2864	(902) 733-2042	
Baker Stevens, Nellie	Eastern Shore Fisherman's Protective Ass. Zone 24 Temporary	P.O. Box 55 Musquodoboit Harbour NS B0J 2L0	(902) 889-2564	(902) 889-2633	esfpa@accesswave.ca
Burchell, David	Rep.. Area / Zone 20 Permanent	Box 106 Dingwall NS B0C 1G0	(902) 383-2460		
Burke, Osbourne	Federation of Gulf N.S. Groundfish Fishermen Temporary	P.O. Box 130 Ingonish. NS B0C 1K0	(902) 285-2276	(902) 285-2099	oburke@NS.SYMPATICO.ca
Dowling, John	4 Harbours Crab Group Non-Adjacent 23 Temporary	Box 40 Ingonish. N.S. B0C 1K0	(902) 285-2301	(902) 285-2685	
Fougere, Pat	Canso Trawlermens Coop..Rep..	P.O. Box 362	(902) 366-2359	(902) 366-2804	caperyan@ns.sympatico.ca

	Area / Zone 24 Temporary	Canso / Guys. Co. NS B0H 1H0			
Fricker, Blair	Area / Zone 21 Permanent	Box 59 Neil's Harbour, NS B0C 1W0	(902) 336-2451		
Hart, Donny	Rep., Area / Zone 24 Temporary	5 Merry Rd., Halifax Co. N.S. B3V 1E9	(902) 868-2140	(902) 868-2596	samfish@net.com.ca
Kaiser, Blair	Area / Zone 24 Permanent	P.O. Box 66 Bickerton West, NS B0J 1A0	(902) 364-2659	(902) 364-2110	
Kehoe, Paul	Area / Zone 24 Experimental Work, Science Guest Permanent	942 Rocky Bay Rd Richmond Co., NS B0E 1K0 B0E 1K0	(902) 226-2115		
Kennedy, Josephine	Rep., Area / Zone 23 Temporary	Box 5602 Louisbourg, NS, B1C 2L8	(902) 733-2741	(902) 733-2407	jo@ns.sympatico.ca
King, Peter	Rep., Area / Zone 23/24 Temporary	139 Eagle Creek Rd. West Bay NS B0E 3K0	(902) 345-2012		peterkking@hotmail.com
MacDonald, Gordon	Area / Zone 23 Permanent	11 Beaumont Avenue Sydney, N.S. B1S 1J4	(902) 564-6566	(902) 564-6906	gcmacd@attcanada.net
MacDonald, Harvey	East Cape Breton Fishermans Association Temporary	4331 Louisbourg Hwy Albert Bridge NS B1K 2P4	(902) 562-1043	(902) 567-0101	
MacInnis, Allan	Rep., Area / Zone 22 Permanent	Box 53, RR1, Englishtown, Vict. Co., NS, B0C 1H0	(902) 929-2477	(902) 929-2710	allan.m@ns.sympatico.ca
MacMullin, Neil P.	Rep., Area / Zone 22 Permanent	28 Lamond St. Sydney Mines, NS B1V 1V9	(902) 736-2048		
Nash, Herb	Rep., Area / Zone 23 Temporary	3 Wadman St. Glace Bay, NS, B1A 1S4	(902) 849-1813	(902) 842-9635	
Rambeau, David	Area 23 Non-Adjacent Core Temporary	P.O. Box 37 Dingwall, N.S. B0C 1G0	(902) 383-2827	(902) 383-2362	david.rambeau@NS.SYMPATICO.CA
Rhynold, Patricia	Guysborough County Inshore Temporary	P.O. Box 98, Canso NS B0H 1H0	(902) 336-3411	(902) 366-2987	patrhynold@ns.sympatico.ca
Rideout, Murray	Area / Zone 21 Permanent	Box 80 Neil's Harbour, NS B0C 1N0	(902) 336-2958		

Touesnard, Ervin	Rep., Area / Zone 24 Temporary	RR#1 River Bourgeois Richmond Co., NS B0E 2X0	(902) 535-2068	(902) 535-2068	SAM.Touesnard@ns.sympatico.ca

Eastern Nova Scotia Observers / observateurs de l'est de la Nouvelle-Écosse

Answorthy, John		Canso, Guys. Co., N.S.	(902) 366-2975		
Baker, Darrin	Area / Zone 4X	P.O. Box 51 Tancook Island, NS B0J 3G0	(902) 228-2053		
Baker, Gerald	Area / Zone 4X	Tancook Island	(902) 275-4620		
Boarder, Dennis	Port Morrien Fishermans Assoc.		(902) 737-5078		
Bollivar, David	Maritime Crab Processors Corp.	32 Beckfoot Drive Dartmouth, N.S. B2Y 4C8	(902) 469-5004 (902) 456-5999 Cell	(902) 461-9689	david.bollivar@ns.sympatico.ca
Chapman, Andrew	Tavel Ltd.	Suite 502 2000 Barrington Street Halifax, N.S. B3J 3K1	(902) 422-4511	(902) 422-9780	achapman@tavel.ca
Conrod, Scott (Observer – Pat Fougere)	Canso Trawlermens Coop., Area / Zone 24	Canso, N.S. B0H 1H0	(902) 366-2553	(902) 366-2831	scott.conrod@ns.sympatico.ca
Courtney, Robert	NSFA	P.O. Box 247 Dingwall, N.S. B0C 1G0	(902) 383-2142	(902) 383-2142	
Cross, Blair	Area / Zone 23	153 Havenside Road Louisbourg, N.S. B1C 1P1	(902) 733-2729		
Dixon, Patrick	Area / Zone 20	Dingwall, N.S. Victoria Co.	(902) 383-2029		
Gray, Patrick **(Observer- Donny Hart)**	Area / Zone 24 4VSW	Sambro	(902) 475-1111	(902) 477-0563	
Green, Kevin		929 Donkin Hwy	(902) 737-5154	(902) 737-1660	
Gurney, Fred (Observer – Pat Fougere)	Canso Trawlermens Coop., Area / Zone 24	P.O. Box 290 Canso, N.S. B0H 1H0	(902) 366-2689	(902) 366-2359	
Hansen, Dannie	Louisbourg Seafoods Area / Zone 23	105 Hansen Road Cape Breton, N.S. B1K 2M2	(902) 539-7048		
Horne, Matthew		Louisbourg, N.S.	(902) 578-2834		
Kennedy, Jerry		1251 Bateston	(902) 733-2741		

		Louisbourg, N.S.			
MacDonald, Jay	Area / Zone 23 Non-Adjacent Core	1385 Main-A-Dieu Road Bateston, N.S. B1C 1V9	(902) 733-3177		
MacDonald, Malcom (Observer)	Area / Zone 23 Experimental Work, Science Guest	9409 Fourchu- St. Peter's Rd, Fourchu N.S., B2J 1A9	(902) 884-2040		msmd@canada.net
MacKinnon, Clarrie	North of Smokey Fishermen's Association	7524 Main Street Louisbourg, N.S. B1C 1J2	(902) 733-2931	(902) 733-2931	thecoolcaptain@seascape.ns.ca
MacKinnon, John	Area / Zone 23 Temp.	11 Byng Street Glace Bay, N.S. B1A 3E9	(902) 849-4082	(902) 733-2407	
MacKinnon, Robert	Area / Zone 23 Temp.	P.O. Box 354 Sydney, N.S. B1P 6H2	(902) 562-6184	(902) 562-6184	bmackinnon@ns.sympatico.ca
Mombourquette, Mark (Observer – Peter King)	Area / Zone 23	RR #3 St. Peters, N.S. B0E 3B0	(902) 587-2317		
Oleary, Eugene (Observer – Patricia Rhynold)	Guysborough County Inshore	Whitehead, N.S. Guy's Co.	(902) 358-2043	(902) 358-2043	
Penney, Christine	Clearwater	757 Bedford Hwy Bedford, N.S.	(902) 457-2348	(902) 443-8443	cpenney@cffi.com
Robicheau, Lloyd (Observer – Nelli Baker Stevens)	Eastern Shore Fisherman's Protective Ass. Zone 24	RR # Box 4 West Chezzetcook, N.S. B0J 1N0	(902) 827-4413	(902) 827-4547	
Smith, Allan	Area / Zone 4X	Clarkes Harbour	(902) 745-1286		
Spencer, Kevin	Area / Zone 23	1933 Main-A-Dieu Road Main-A-Dieu, N.S. B1C 1W3	(902) 733-3030		
Stevens, Gary	Area / Zone 4X	P.O. Box 13 Tancook Island, NS B0J 3G0	(902) 228-2537		
VanHelvoort, Gus	DFO Area Director of Fisheries Management, ENS Area	Coast Guard College P.O. Box 1085 Sydney, N.S. B1R 2J6	(902) 564-2400	(902) 564-7398	VanHelvoortG@dfo-mpo.gc.ca

Appendix 5. Documents Tabled

Biron, M., L. Savoie, K. Drinkwater, and M. Moriyasu. 2002. Assessment of the 1999/2000 and 2000/2001 snow crab (*Chionocetes opilio*) fishery off southeastern Nova Scotia (NAFO Division 4X;CFA 27). RAP Working Paper 2002/15.

Referees : G. Chouinard, John Tremblay, Peter Koeller

Biron, M., L. Savoie, R. Campbell, M. Moriyasu, and P. DeGrace. 2002. Assessment of the 2001 snow crab (*Chionocetes opilio*) fishery off eastern Nova Scotia. RAP Working Paper 2002/16.

Referees : Ghislain Chouinard, John Tremblay, Peter Koeller

Appendix 6. Survey Form for Location Preferences

Snow Crab RAP
Eastern Nova Scotia
30-31 January 2002

Do you believe we should combine next years RAP with the Gulf Region or do you accept the new process being presented separately and in Halifax?

Combine with Gulf Region : Yes _____ No _____

Separately and in Halifax : Yes _____ No _____

Comment :

_____
_____
_____
_____
_____
_____
_____
_____

Name: _____

Area: _____